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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/911,408	07/25/2001	Kenji Inage	110199	4088

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EXAMINER

LE, MINH

ART UNIT PAPER NUMBER

2652

DATE MAILED: 04/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/911,408

Applicant(s)

INAGE ET AL.

Examiner

Minh Le

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 1.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-20 rejected under 35 U.S.C. 103(a) as being unpatentable over

Nakamoto et al. (U.SP. 5,936,810) in view of Gill (U.S.P. 6,538,859).

3. As to claims 1, 6, 11 and 16, Nakamoto teaches a magnetoresistive device in Fig. 1 comprising a magnetoresistive element 10 having two surfaces that face toward opposite directions and two side portions that connect the two surfaces to each other, two bias field applying layers 12, 12 that are located adjacent to the side portions of the magnetoresistive element and apply a bias magnetic field to the magnetoresistive element, and two electrode layers 14, 14 that feed a current used for signal detection to the magnetoresistive element, each of the electrode layers being adjacent to one of surfaces of each of the bias field applying layers, wherein at least one of the electrode layers overlaps one of the surfaces of the magnetoresistive element the magnetoresistive element incorporates a nonmagnetic layer 20 having two surfaces that face toward opposite directions, a soft magnetic layer 18 adjacent to one of the surfaces of the nonmagnetic layer, a pinned layer 22, located adjacent to the

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other one of the surfaces of the nonmagnetic layer, whose direction of magnetization is fixed and an anti-ferromagnetic layer 16 located adjacent to one of surfaces of the pinned layer that is farther from the nonmagnetic layer, the anti-ferromagnetic layer 16 fixing the direction of magnetization of the pinned layer 22 (col. 7, lines 1-38)

Nakamoto does not teach the pinned layer that includes a nonmagnetic spacer layer and two ferromagnetic layers that sandwich the spacer layer and have direction of magnetization fixed to opposite directions.

Gill teaches a magnetoresistive sensor in Fig. 6, wherein the pinned layer 622 includes a nonmagnetic spacer layer 626 and two ferromagnetic layers 628, 624 that sandwich the spacer layer and have direction of magnetization fixed to opposite directions 629, 625.

It would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the Nakamoto magnetoresistive sensor having the pinned layer that includes a nonmagnetic spacer layer and two ferromagnetic layers that sandwich the spacer layer and have direction of magnetization fixed to opposite directions, in order to provide a sensor having a low intrinsic uniaxial anisotropy as taught by Gill in col. 1, lines 20-21.

4. As to claims 2, 7, 12 and 17, Nakamoto teaches the magnetoresistive device wherein the total length of regions of the two electrode layers that are

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laid over the one of the surfaces of the magnetoresistive element is smaller than  $0.3\mu\text{m}$  (Fig.5).

5. As to claims 4, 9, 14 and 19, Nakamoto teaches the magnetoresistive device in Fig. 1, wherein the two bias field applying layers 12, 12 are located off one of the surfaces of the magnetoresistive element 10.

6. As to claims 5, 10, 15 and 20, Nakamoto teaches the magnetoresistive device, wherein a space between the two electrode layers is equal to or smaller than approximately  $0.6\mu\text{m}$  (Fig. 5).

7. As to claims 3, 8, 13 and 18, Nakamoto teaches the magnetoresistive device, wherein both of the two-electrode layers overlap the one of the surfaces of the magnetoresistive element.

But Nakamoto does not teach the length of the region of each of the two electrode layers that is laid over the one of the surfaces of the magnetoresistive element is smaller than  $0.15\mu\text{m}$

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the magnetoresistive device, wherein the length of the region of each of the two electrode layers that is laid over the one of the surfaces of the magnetoresistive element is smaller than  $0.15\mu\text{m}$

The motivation would have been obvious because one of ordinary skill in the art would have been motivated to modify a magnetoresistive device in

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the course of routine engineering optimization/experimentation to provide the magnetoresistive device, wherein the length of the region of each of the two electrode layers that is laid over the one of the surfaces of the magnetoresistive element is smaller than  $0.15\mu\text{m}$ , in order to define the effective read track width with accuracy.

Moreover, absent a showing of criticality, i.e., unobvious or unexpected results, the condition of smaller than  $0.15\mu\text{m}$  as set forth in claim 3 are considered to be within the level of ordinary skill in the art.

Additionally, the law is replete with cases in which the mere difference between the claimed invention and the prior art is some range, variable, or other dimensional limitation within the claims, patentability cannot be found.

In furthermore has been held in such a situation, the applicant must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range(s); see *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Moreover, the instant disclosure does not set forth evidence ascribing unexpected results due to the claimed dimensions; see *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338 (Fed. Cir. 1984), which held that the dimensional limitations failed to point out a feature which performed and operated any differently from the prior art.

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## INQUIRES


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Minh Le whose telephone number is (703) 305-7867.

The examiner can normally be reached on 10:00AM - 7:00PM (Mon- Fri).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa T Nguyen can be reached on (703) 305-9687. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3718 for regular communications and (703) 305-3718 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

ML  
April 7, 2003



**BRIAN E. MILLER**  
**PRIMARY EXAMINER**